Study finds the stronger the side effects, the longer lasting the vaccination

March 6 2023, by Kim Krieger

Credit: Tina Encarnacion/UConn Health photo

Health care workers who had symptoms after their COVID-19 vaccination gained a more durable immunity than those who didn't, report UConn Health researchers in a recent issue of *Vaccines*.

Nurses, doctors, and other hospital workers had some of the highest rates of COVID exposure during the early days of the pandemic. Some were infected and recovered; all were at continued risk simply due to potential occupational exposure. That made them an ideal group in which to test the effects of the COVID vaccines that became available in spring of 2021.

UConn Health researchers recruited 296 of their colleagues to participate in a vaccine study that began that spring, including 46 who had already had COVID. The participants were vaccinated with either the Pfizer or the Moderna mRNA vaccines, whichever was available at the time. (Originally the study included health care workers vaccinated with Johnson & Johnson's product, but not enough participants ended up receiving that vaccine to make the results statistically significant.) The workers in the study had their blood tested for neutralizing antibodies at two months post-vaccination, then at five months and again at nine months.

Neutralizing antibodies specifically attack the parts of the virus important for infection. Other antibodies might react to parts of the virus but be ineffective at stopping it from infecting other cells. Not all antibody tests look specifically for neutralizing antibodies, and that specificity is one of this study's strengths, says UConn School of Medicine chief of infectious diseases Kevin Dieckhaus, one of the authors.

Viewed through the lens of neutralizing antibodies, the data is clear: the mRNA vaccines elicit a strong neutralizing antibody response in the first few months from people who have never been infected with COVID before. But the level of neutralizing antibodies drops off pretty steeply by nine months.

In people who have already been infected with COVID, the response is

stronger: the neutralizing antibody response is higher initially, and doesn't drop off as steeply over time. And in both groups, getting a fever, aches, or a sore arm after vaccination predicted a stronger, longer lasting neutralizing antibody response.

"Prior infection with COVID meant you were more likely to have a sustained immune response. It definitely set your immune system to respond in a more vigorous way to the vaccination," Dieckhaus says.

The data confirms what earlier studies had reported. In middle aged people, the antibody response from the vaccines is relatively strong but short lived.

The researchers are continuing the study, and currently tracking antibody levels in participants who received boosters, as well as whether they have contracted COVID since being vaccinated. They hope to help answers other questions, such as whether the antibody response to boosters behaves similarly over time to the initial shots, and why some people get infected with COVID repeatedly while others don't.

More information: Kevin D. Dieckhaus et al, SARS-CoV-2 Antibody Dynamics in Healthcare Workers after mRNA Vaccination, *Vaccines* (2023). DOI: 10.3390/vaccines11020358

Provided by University of Connecticut